

P_T Reco from MC Comparing with Data

Slide 1

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RadLab Meeting

May. 22, 2019 @ 3 pm JST

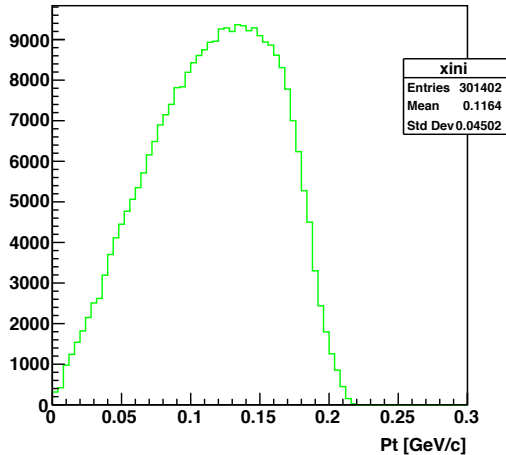
Content

- UPC true and reco P_T – last meeting
- DPMJET true and reco P_T
- UPC + DPMJET combined true and reco P_T
- UPC + DPMJET P_T comparison with data

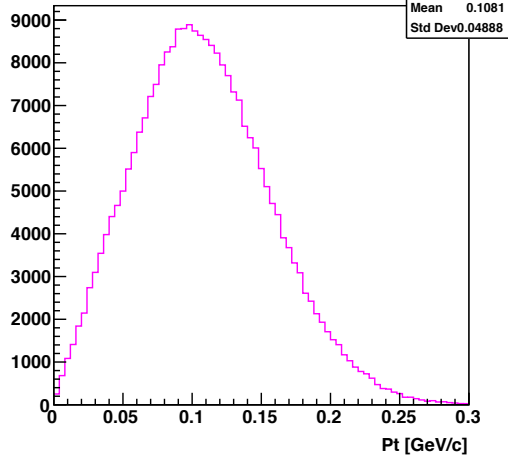
True and Reco P_T Distributions (UPC) – Recap

Slide 2

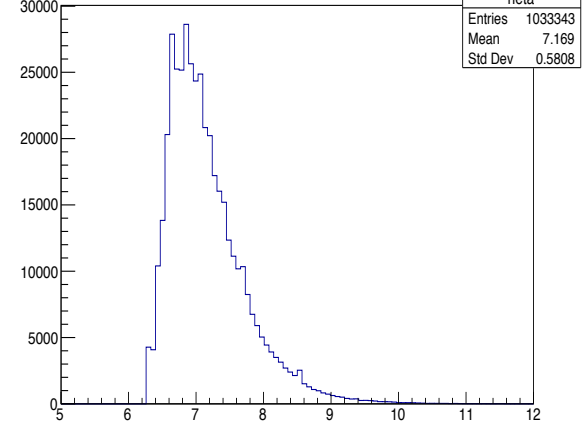
Truth UPC MC



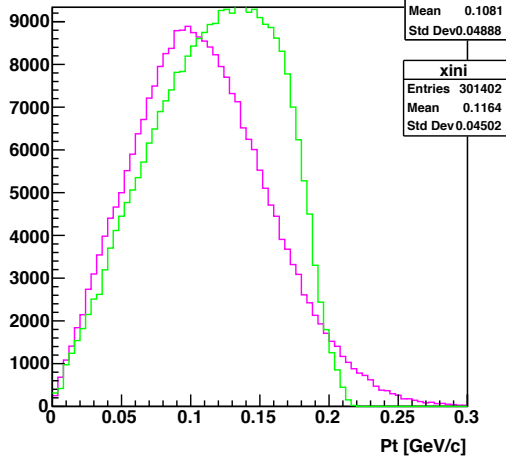
Reco UPC MC



eta



Reco UPC MC

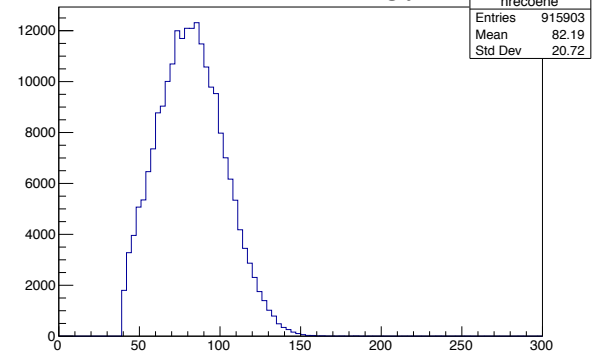


$$P_T = \frac{r}{IP} * E_r \quad r = \sqrt{x^2 + y^2}$$

CUTS

- Eta > 6.8
- ZDC energy > 40 GeV.

ZDC energy



True and Reco P_T Distributions (DPMJET)

Slide 3

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TABLE I. Cross sections for neutron production in ultraperipheral collisions and hadronic interactions at $\sqrt{s_{NN}} = 200$ GeV. Cross sections in parentheses are calculated without η and x_F limits.

UPCs		Hadronic interactions	
p^\uparrow Al	p^\uparrow Au	p^\uparrow Al	p^\uparrow Au
0.7 mb (2.2 mb)	19.6 mb (41.7 mb)	8.3 mb	19.2 mb

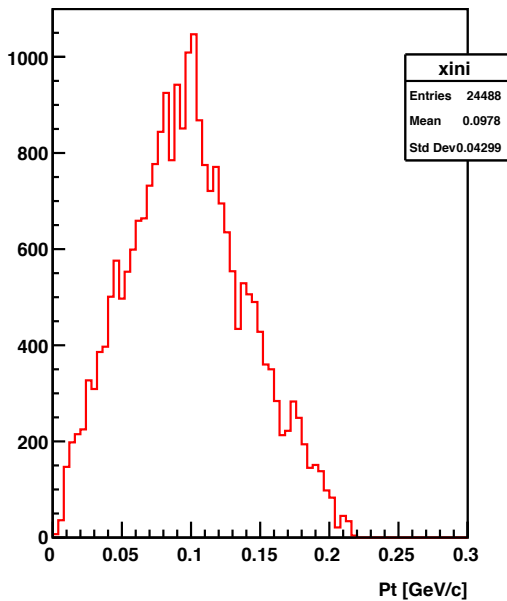
- UPC to DPMJET combination is approximately 1 : 1 ratio based on above cross sections for pAu data.
- So currently working with 915, 903 maximum available UPC events and 900,000 DPMJET events out of 1, 993, 000 maximum available DPMJET events.

True and Reco P_T Distributions (DPMJET)

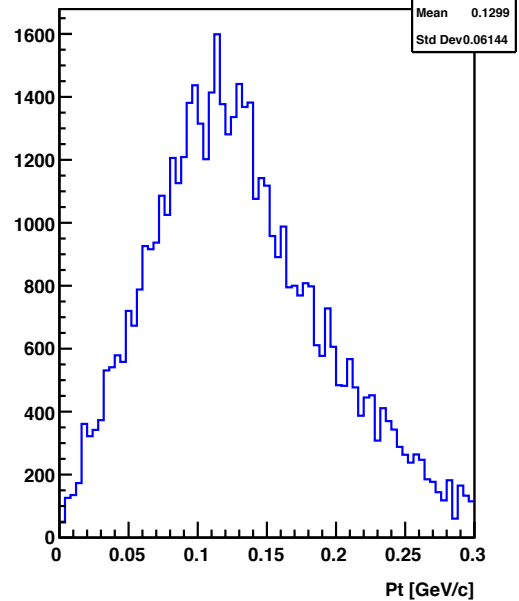
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Before eta = 6.8 cut

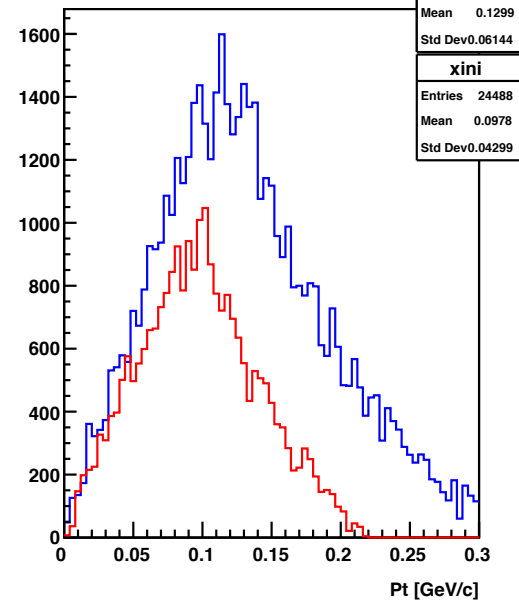
Truth DPMJET MC



Reco DPMJET MC



Reco DPMJET MC

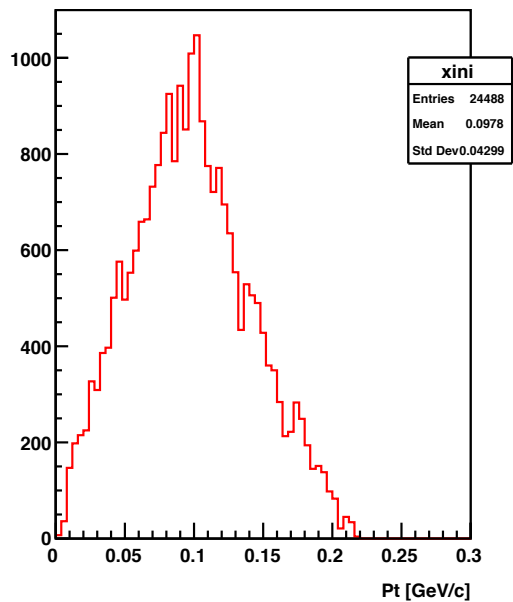


True and Reco P_T Distributions (DPMJET)

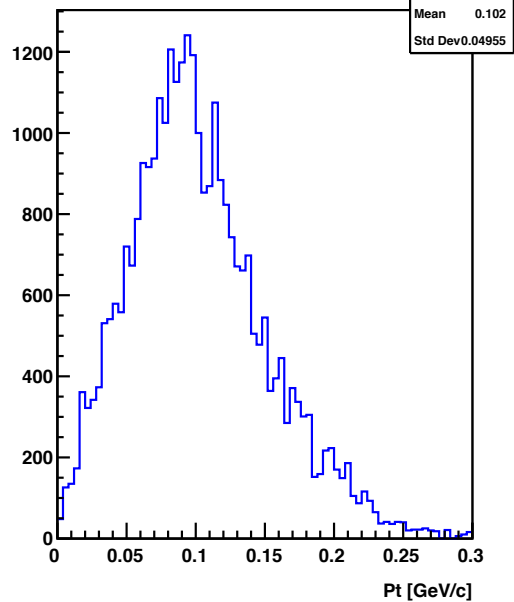
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After both $\eta = 6.8$ and energy > 40 GeV cuts

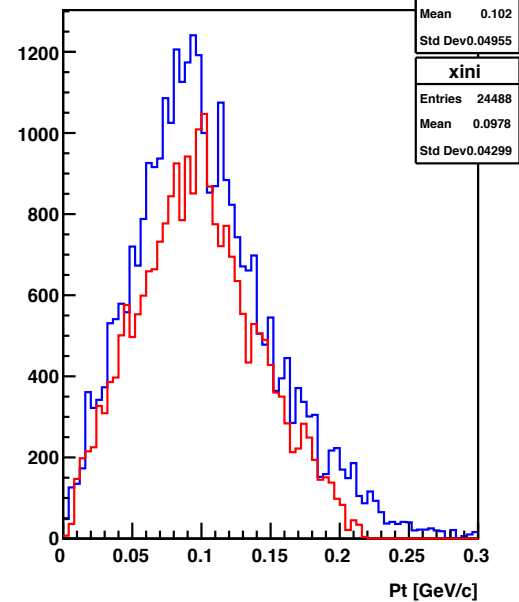
Truth DMPJET MC



Reco DPMJET MC



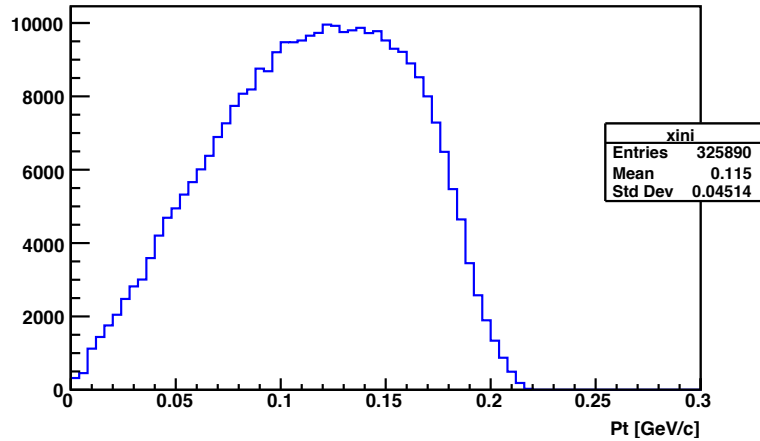
Reco DPMJET MC



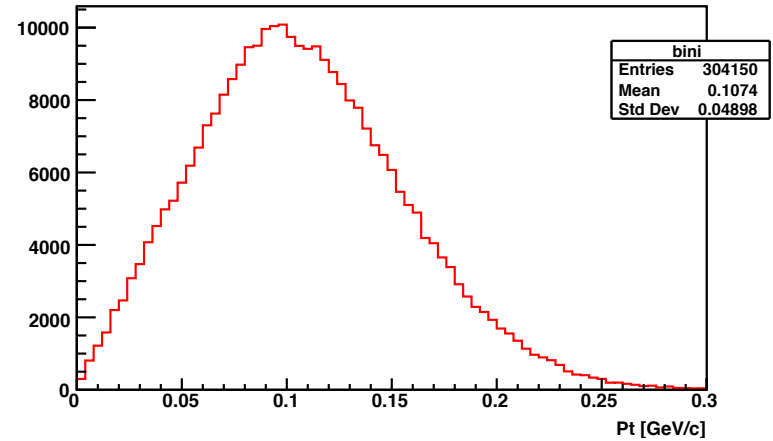
UPC + DPMJET True and Reco P_T Distributions

Slide 6

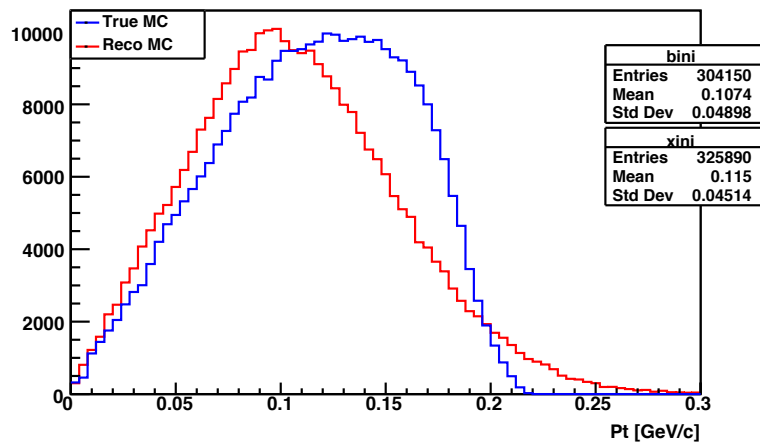
True UPC+DPMJET MC



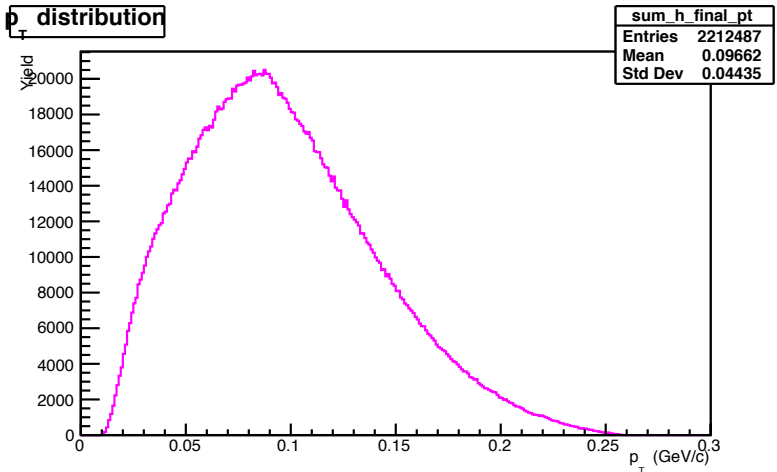
Reco UPC+DPMJET MC



Reco UPC+DPMJET MC



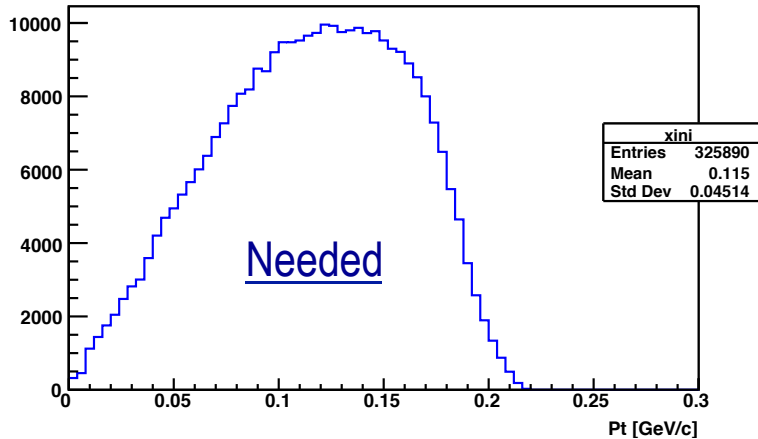
p_T distribution



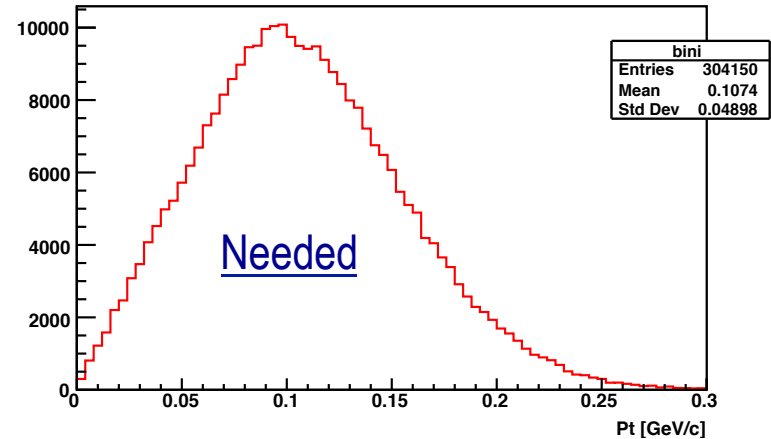
MC Inputs to Unfold Data Using TSVDUnfold

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True UPC+DPMJET MC

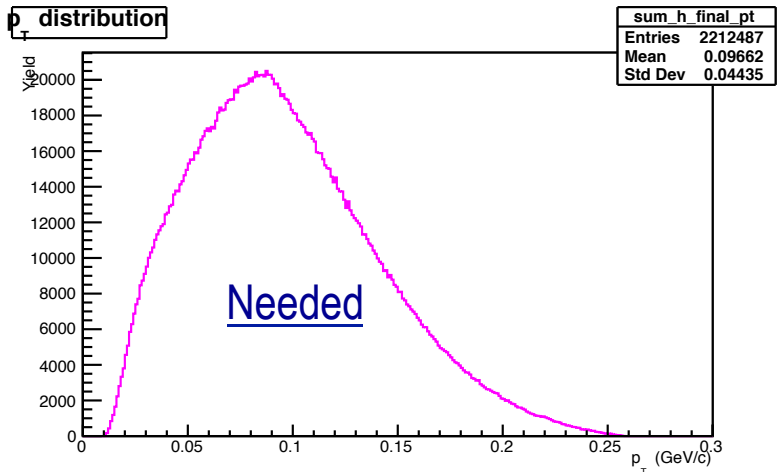


Reco UPC+DPMJET MC



- Also need a 2D hist. of true P_T as a function of reco P_T – smeared detector response matrix.
- But before plotting response matrix – need to ensure reco P_T from UPC and DPMJET combined reproduces data.

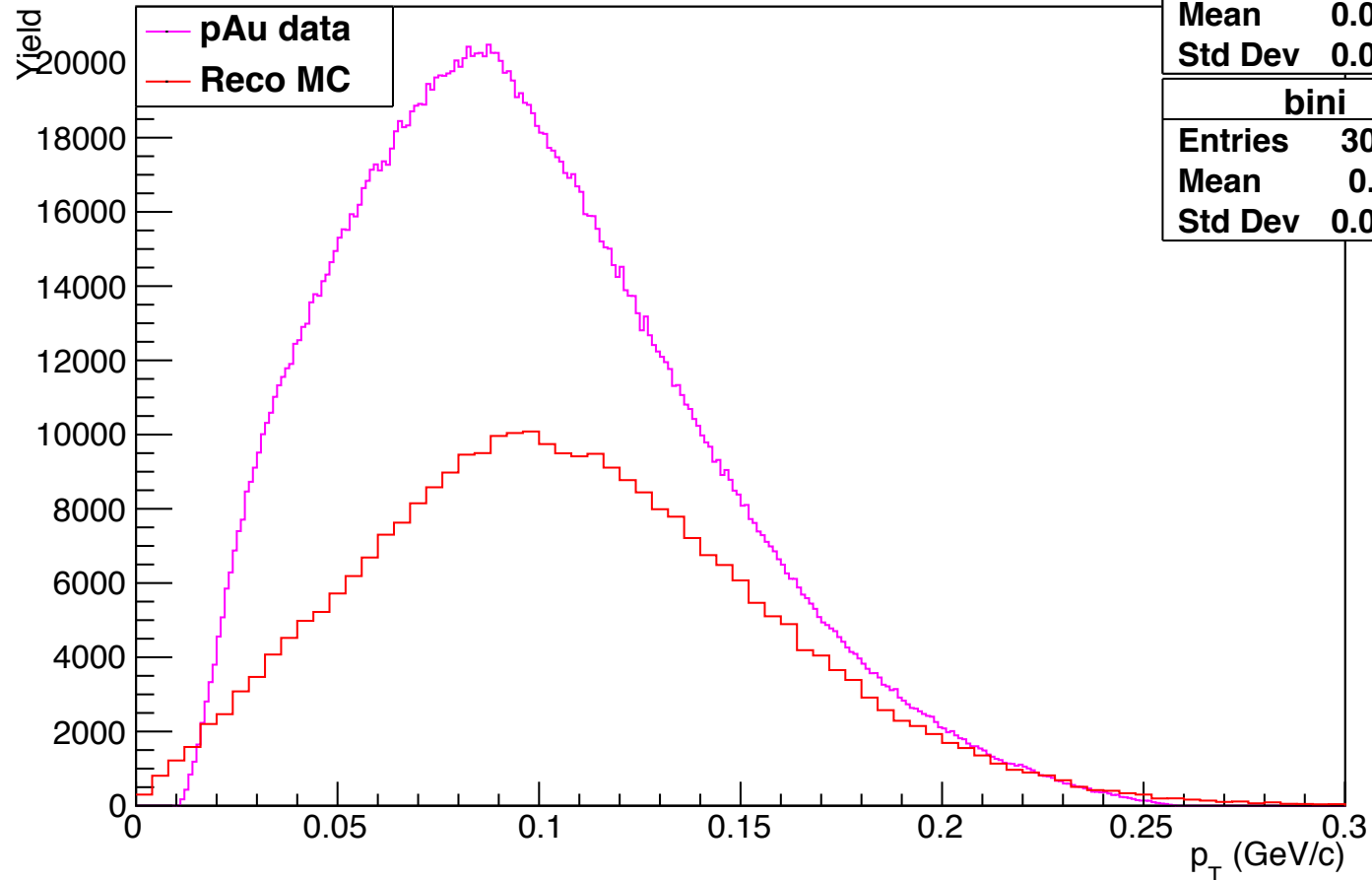
p_T distribution



UPC + DPMJET Reco and Data P_T Comparison

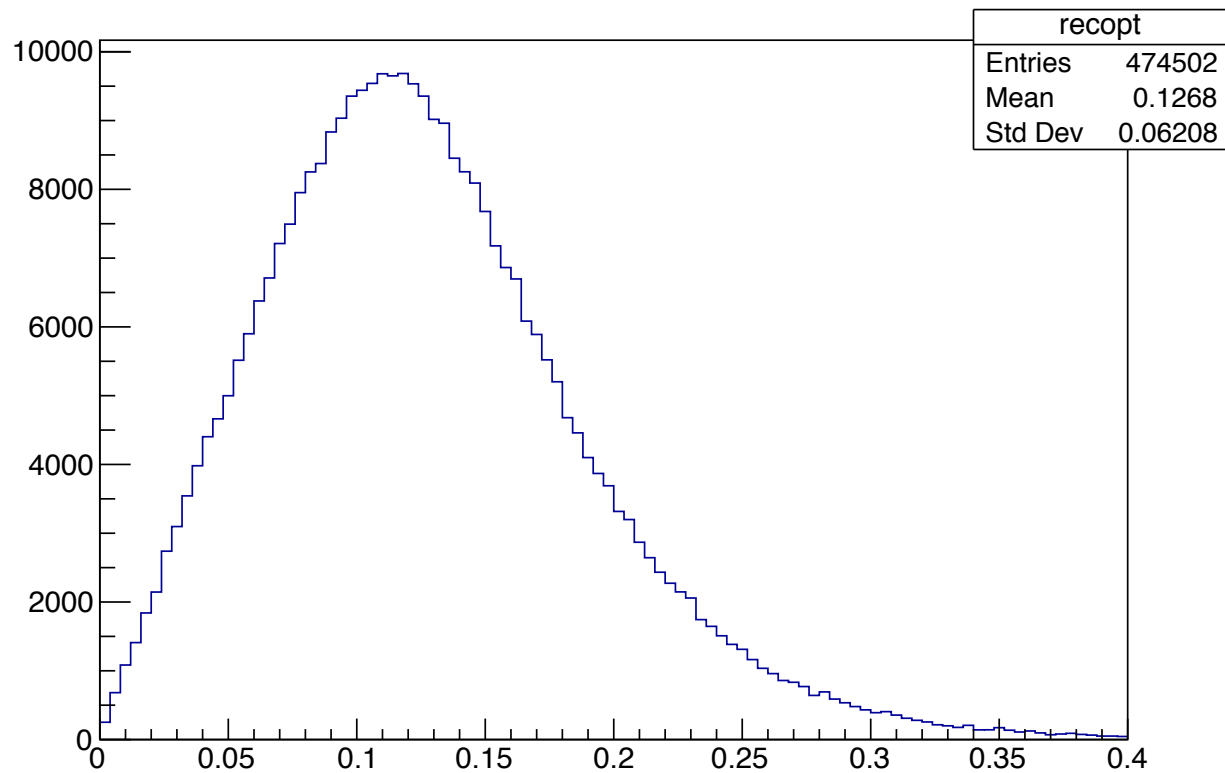
Slide 8

p_T distribution



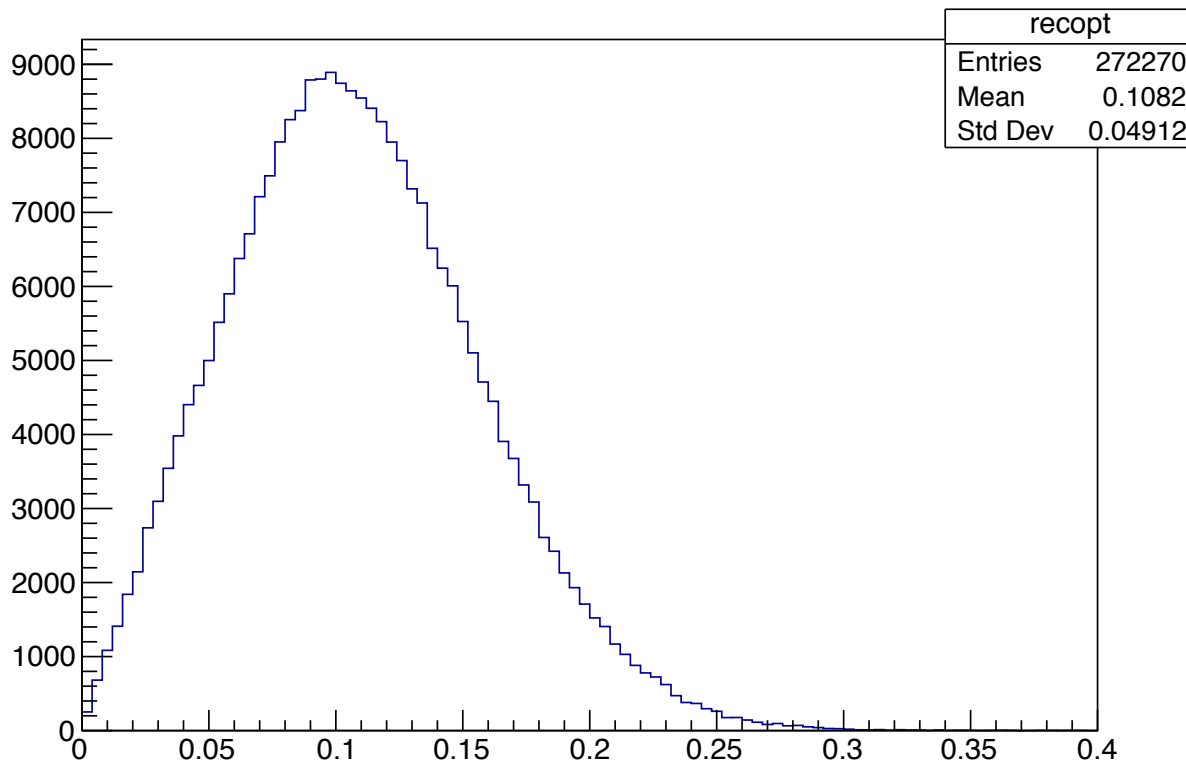
Backup1: Reco P_T Distribution (UPC MC)

Before applying eta cut condition



Backup2: Reco P_T Distribution (UPC MC)

With Eta > 6.8 and ZDC energy > 40 GeV applied



Backup3: Reco-True P_T Comparison

